Iowa Conservation Showcase

High Priority Letter Spurs Changes in Feedlot

After receiving a letter from the Iowa Department of Natural Resources (DNR) in 2001 indicating his 4,500-head open cattle feedlot was a high environmental priority, Plymouth County farmer Rick Hansen knew he needed to make changes to his feedlot.

Because of its large size and severe slope, Hansen installed a total containment structure, or storage pond, below his feedlot to replace a basin that was not functioning adequately. Containment structures keep manure discharges out of neighboring water sources or waters of the state (i.e. streams, lakes, ponds, drainage systems).

Hansen, of Hinton, Iowa, took advantage of cost-share incentives through the USDA's **Environmental Quality Incentives Program (EQIP)** by signing a contract in 2002 to install a complete animal waste system. The USDA's Natural Resources Conservation Service (NRCS) designed the project.

Rick Hansen

Building the Storage Pond

Construction on the storage pond began in September 2005, but it was not complete until the spring of 2006, due to an unexpected perched water table on Hansen's property that set the timetable back several months. The perched water table was positioned above the normal water table because of the presence of an impermeable clay soil layer.

The five-acre total containment structure was necessary because of the size and slope of Hansen's feedlot.

NRCS Natural Resources Conservation Service

Hansen said about 300,000 yards of dirt was excavated. "It was a soupy mess," he said. "We wanted to take dirt out of the bottom and haul it to the top, but it was so wet it was unusable." Tile was also added to keep the containment structure stable.

Sediment Basins

In addition to the five-acre storage pond, the animal waste system called for four sediment basins. Basins were strategically placed between the feedlot and pond, slowly releasing liquids into the pond through vertical wooden picket fences and outlets. Sediment basins allow time for solids to settle out.

Outlet structures, such as this one in Hansen's sediment basin, helps keep solids out of the total containment structure and allows liquids in.

Hansen cleans out the basins after major rains or after one foot of sediment is trapped in the basins. He then uses or sells the excess solids for fertilizer.

Hansen has since added a few more sediment basins on his own. "We want to keep the manure as high up on the hill as possible," he said. "In time, I'd like to have one [sediment basin] for every pen. I think it would be a lot better for us."

Diversions were also constructed to keep outside clean water from entering the system, reducing the amount of storage space needed.

System Design

Despite a few untimely heavy rains, Hansen said the system is working well. He also said the scope of the project was bigger than he expected. "This isn't a deal where you go out there and dig a hole. It's a lot more intense than I ever dreamed it would be," he said. "The NRCS engineers went out of their way to do anything they could for us."

The entire animal waste system totaled $400,000, with Hansen receiving EQIP cost-share on a portion of that. His share went up slightly because the final cost exceeded the estimated cost, partly due to time delays because of the perched water table. "And in the meantime, diesel fuel went from $1.50 per gallon to $3 per gallon, so the final bill from the excavator was higher," said Hansen.

Although the project scope exceeded his expectations, Hansen's operation required the extensive system. "It's good Rick did the total containment," said Plymouth County District Conservationist Jim Lahn. "It's necessary on all large feedlots like his, and to follow regulations, he did the right thing."

According to Mark Garrison, Environmental Engineer for NRCS in Iowa, a major key to the success of waste management systems is proper maintenance and operation. "If the producer takes care of the system by cleaning out and maintaining the lot and structures, the system will be effective by preventing solids from leaving the system," he said. "This helps protect water quality and prevents violations from occurring."

CNMPs

Any producer who receives EQIP funds for an animal waste system must develop and implement a Comprehensive Nutrient Management Plan (CNMP). A CNMP is a specific plan for an Animal Feeding Operation (AFO) - it addresses the management and treatment necessary for the operator to protect soil and water resources.

"The CNMP helps the producer analyze the manure and calculate what nutrients are available for crop production," says Steve Brinkman, Nutrient Management Specialist for NRCS in Iowa. "CNMPs serve as a guide for the producer to best utilize nutrients for crop production."

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To learn more about animal waste systems, visit your local NRCS office or go online to www.iowadnr.com/afo/index.html.

Sediment basins, with the help of picket fences and outlet structures, settle out the solids and allow liquids to flow into the total containment structure below.

Jason Johnson, Iowa NRCS
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